

Gulfco Workplan Outline

1. Analytical Methods:

1. Surface water and ground water: Analytical methods with detection limits, for all analytes, equal to or less than the Ecological Benchmarks for Water, Table 3-2: "*Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas*"; December 2001; RG-263 (revised), including any updates.
2. Sediment: Analytical methods with detection limits, for all analytes, equal to or less than the Ecological Benchmarks for Sediment, Table 3-3: "*Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas*", including any updates.
3. Soil north of Marlin Ave.: Analytical methods with detection limits, for all analytes, equal to or less than the EPA Ecological Soil Screening Levels; or Ecological Benchmarks for Soil, Table 3-4: "*Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas*", including any updates, for analytes not included in EPA's Ecological Soil Screening Levels.
4. Soil south of Marlin Ave.: Equal to or less than the EPA Region 6 Soil Screening Levels for commercial/industrial human health exposure.

2. Soil Samples: (maximum 200 ft. grid spacing north of Marlin Ave; maximum 100 ft grid spacing south of Marlin Ave; and 20 biased samples)

1. Samples should be collected from one randomly selected location within each grid block.
2. Sample @ 0" - 6", for semi-volatiles, pesticides, PCBs, and metals analysis.
3. Sample @ 12" - 24", for volatiles, semi-volatiles, pesticides, PCBs, and metals analysis.
4. Background soil samples: 6 samples from each of two locations, NE and NW of Site, collected using same methods as Site soil samples.
5. Soil samples for VOC analysis should be collected using Method 5035.
6. Soil samples from the vacant lot area southwest of the Gulfco property. This area should be divided into grids with maximum grid block dimensions of 100 feet by 100 feet. Samples should be collected from one randomly selected location within each grid block. The samples should be collected from a depth of 0" to 1" bgs with sample analysis for SVOCs, pesticides, PCBs, and metals.
7. Three representative soil samples collected from the Site north of Marlin Avenue, and three representative soil samples collected from the Site south of Marlin Avenue, should be analyzed for bulk density, porosity and pH.
8. Should a grid location at the perimeter of the Site exceed the screening criteria, then a minimum of two additional grids with maximum dimensions of 200 feet should be created outside of the exceeding grid, and these new grid areas should

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be sampled at one random location within each grid and analyzed in the same fashion as the soil samples in this task.

3. Ground Water Samples:

1. Maximum 200 ft grid spacing.
2. Samples should be collected from one randomly selected location within each grid block.
3. Perform shallow sampling in area of impoundments to define potential DNAPL area; then perform deeper sampling as necessary to define vertical extent outside of any DNAPL area to avoid dragging down DNAPL.
4. The samples should be collected within the upper ten feet of the uppermost aquifer. The sample analysis should include VOCs, SVOCs, pesticides, PCBs, metals, and TPH.
5. These ground water samples may be collected using direct push technology.
6. An additional 8 soil borings (in addition to the 7 borings for the monitoring wells) should be drilled 75 to 100 feet outside of the edge of the former impoundments. Additional borings should be drilled as necessary to define the vertical and horizontal extent of any DNAPL zones. Direct push technology may be used as an alternative to borings for defining the DNAPL zones.
7. DNAPL field screening methods used with direct push may be used to evaluate the extent of DNAPL, subject to DMA requirements and EPA approval.
8. Should any ground water sample location at the perimeter of the Site exceed the screening criteria, then a minimum of two additional ground water samples should be collected outside of the location exceeding the screening levels in the same water bearing zone. These additional ground water samples should be collected and analyzed in the same fashion as the ground water samples in this task. In addition, a minimum of three locations should be sampled for ground water from the water bearing zone located immediately below the water bearing zone that exceeded the screening levels, unless this sampling would result in the penetration of a DNAPL zone. In that case, the DNAPL zone should be defined, and the deeper samples collected outside of the DNAPL zone. This collection of additional samples should be repeated, both vertically and horizontally, until the extent of ground water contamination has been determined.

4. Surface Water Samples:

1. Wetlands north of Site: 15 samples
2. Fresh Water Ponds in Lot 55: 6 samples (3 samples in each pond)
3. Analyze samples for VOCs, SVOCs, pesticides, PCBs, and metals.
4. Metals analysis on both filtered and unfiltered samples.

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5. Measure hardness and pH on all surface water samples.

5. Sediment Samples:

1. Wetlands north of Site: 15 locations, one sample at surface of sediment (0" to 6"). The location of the sediment samples should be biased based on the drainage pathways from the Site.
2. Barge slips and Intracoastal Waterway: 16 locations, one sample at surface of sediment (0" to 6").
 1. 5 locations in Barge Slip No. 1;
 2. 5 locations in Barge Slip No. 2; and
 3. 6 locations in the Intracoastal Canal next to the Site.
3. Fresh Water Ponds in Lot 55: 8 sediment sample locations (5 locations in the large pond and 3 in the small pond). At each sampling location, sediment samples should be collected as above.
4. Analyze sediment samples for VOCs, SVOCs, pesticides, PCBs, metals, and TPH.
5. Grain size and total organic carbon (TOC) should be measured on all sediment samples.
6. Should any sediment sample location at the perimeter of the sampled wetland area exceed the screening criteria, then a minimum of two additional sediment samples should be collected within 200 feet of the location exceeding the screening levels. This collection of additional sediment samples should be repeated until the extent of sediment contamination has been determined.
7. Collect surface sediment samples (0" to 6") from 4 locations in canals in the nearby community.

6. Fish/Crab Samples:

1. Intracoastal Canal adjacent to Site: 6 samples (filets) from each of 3 edible fish species (9 total), 6 crab samples from one crab species, fish and crab to be larger than legal possession size.
2. Background: 3 fish samples (filet) from each of 3 fish species (9 total), 3 crab samples from one crab species, fish and crab to be larger than legal possession size. Background samples collected from 0.75 miles NE of Site.
3. Analyze for SVOCs, pesticides, PCBs, and metals (no VOC analysis).

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7. Notes:

1. Number of samples is based on environmental sampling only. Additional samples will be required for the QA/QC requirements (i.e., field blanks, trip blanks, rinsate blanks, duplicates, MS/MSD, etc.).
2. Quality control sampling frequency shown in the table below should be used.

Media	Field Duplicate	Equipment Rinsate Blank	Trip Blank	Field Blank	Matrix Spike/Matrix Spike Duplicate
Aqueous	1 in 20	1 in 20 or one per day	One per sample shipment (VOCs only)	One per day	1 in 20
Soil & Sediment	1 in 20	1 in 20 or one per day	Not required	Not required	1 in 20
Tissue	Not required	1 in 20 or one per day	Not required	Not required	Not required

3. Determine the lateral and vertical extent of potential DNAPL and COCs.
4. Number of samples is for the initial sampling phase. Additional sampling may be required if initial sampling is not sufficient to define horizontal and vertical extent of contamination, or to better define “hot spots”, or to fill in any data gaps.
5. Vertical/horizontal extent based on following benchmarks:
 1. Soil:
 1. North of Marlin Ave.: EPA Ecological Soil Screening Levels; or, in not available, then TCEQ Ecological Benchmarks for Soil, Table 3-4.
 2. South of Marlin Ave.: EPA Region 6 Soil Screening Levels for commercial/industrial human health exposure.
 3. Soil samples no deeper than the water table.
 2. Ground Water: TCEQ Ecological Benchmarks for Water, Table 3-2; ground water PRGs based on ecological receptors because of potential for migration to surface water.
 3. Sediment: TCEQ Ecological Benchmarks for Sediment, Table 3-3.
 4. Surface Water: TCEQ Water Quality Standards, or, if not available, then Ecological Benchmarks for Water, Table 3-2.

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6. Provide the analyte list for each proposed analytical method.
7. Do not composite samples.
8. Surface water metals analysis shall be performed on both filtered and unfiltered samples. Also, pH and hardness shall be determined for all surface water samples.
9. Grain size and total organic carbon (TOC) shall be measured on all sediment samples.
10. Collect undisturbed soil samples from 4 borings in the former impoundment cap and perform laboratory hydraulic conductivity tests.
11. Fish/crab sampling outlined here shall be only for the purpose of human health risk assessment.
12. To evaluate groundwater flow rate and direction, in addition to using water level data to construct potentiometric surface maps for the Site, a staff gauge should be placed in the surface water in the wetlands to the northwest of the Site in addition to one installed at the Intracoastal Waterway shoreline (to allow comparison of groundwater elevations to surface water levels).
13. Additional biological data and co-located media data collection may be necessary for a baseline ecological risk assessment based on SLERA & sampling results.
14. Commercial/industrial cleanup levels will require institutional controls if remediation will not result in unrestricted use and access.
15. If contaminated ground water has moved off-site or may impact current/future residential areas, then the vapor intrusion pathway will need to be evaluated.
16. Characterize the geology and hydrogeology to the drinking water aquifer at the Site.